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Strawberry Improvement:

Past and Future



Project Proposal
January 10, 1996

Plant Genome Data & Information Center, NAL

**United States
Department of
Agriculture**



National Agricultural Library

U.S.D.A., NAL

MAY 24 2007

CATALOGING PREP

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Appendix IV: Alan E. Fusonie, "Dr. George Darrow: Legacy and Foundation for Tomorrow's Strawberries" *Advances in Strawberry Production*, Vol. 9, 1990.

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CATALOGING PREP

Strawberry Improvement: Past and Future

Introduction

The Plant Genome Data & Information Center proposes to sponsor a digitization project on the history of strawberry breeding, highlighting the important role of USDA in general and the efforts of Dr. George M. Darrow in particular. During Darrow's 46 year career with USDA, he was responsible for developing many new strawberry varieties and improving various fruit cultivars. Darrow was widely acknowledged by his contemporaries as a leading strawberry and other small fruits expert, and has since been honored by a retrospective exhibit at the National Agricultural Library and induction into the Prince George's County Hall of Fame.

We plan to build a comprehensive online information resource on the history, research and practice of strawberry breeding and improvement. Pending resolution of the copyright, we will provide a full-text digital copy of George Darrow's widely respected 1966 work *The Strawberry: History, Breeding and Physiology*, supplemented by current and retrospective bibliographies, ongoing research at USDA and elsewhere, and statistical information about the strawberry industry. Our site will also serve as a pathfinder for substantial strawberry information already available on the World Wide Web, linking to sites in education, industry and government. We plan to contextualize Darrow's published work with digitized documents from his manuscript papers housed in NAL's special collections. This primary source material, useful to current researcher and historian of science alike, includes professional correspondence, Darrow's notes from the field, and research materials from his many scientific publications. Darrow's enduring legacy and importance to the strawberry community will allow us to present these materials both as historical sources and as living documents of research value to scientists today. Finally, we plan to enhance these valuable documents with SGML, using the Bean Improvement Cooperative prototype project as a model. This resource will be made available on the World Wide Web, with potential conversion to a portable CD-ROM product as well.

Goals

To provide a comprehensive information resource on the history, research and practice of strawberry breeding and improvement, for scientists, educators, students and breeders -- demonstrating the richness of resources available at the National Agricultural Library and around the world, and to actively engage the user population of this resource in its development and expansion.

Approach

At the core of this project are the materials of George Darrow. We believe his career at USDA as a horticulturist, his overseas experiences as a germplasm collector, as well as his pioneering efforts in home production and the "pick your own" industry, have a uniquely

broad appeal likely to reach NAL's diverse audiences.

Darrow's 1996 work, *The Strawberry*, will thus serve as the organizational model of our project. The book's intellectual structure will shape our choices for bibliographic references, supplementary manuscript materials and links to external sites.

A search through the Library of Congress Copyright Office indicated that the copyright to *The Strawberry* was registered in 1966 and automatically renewed in 1992. After an extensive good faith search, we have been unable to locate the organization or individual to whom the copyright was registered. In this light, we plan to seek legal counsel to determine our options for digital reproduction of the work.

Crucial to the success of this project will be its ability to deliver relevant information and meet user needs. Toward this end, the Plant Genome Data & Information Center has been consulting with various scientists and members of the strawberry community. Throughout the project, we plan to actively solicit the input of these advisors. At the present time, these advisors include:

- Dr. James Reveal, *Professor, University of Maryland Department of Plant Biology*
- Dr. Chad Finn, *Research Geneticist, USDA-ARS Northwest Center for Small Fruits Research*
- Dr. Kim Hummer, *USDA-ARS National Clonal Germplasm Repository*
- Ms. Denise Kurtz, *granddaughter of George Darrow*
- Dr. Ray Altevogt, *Former consultant to the Fresh Fruit & Produce Association*

The Plant Genome Data & Information Center only has sufficient funds for the preliminary stages of this project, providing that the scanning is performed in-house, using NAL's text-digitizing facilities. Within the month, we will begin seeking outside funding sources to secure the project's proper development and expansion. With the search for funding sources, the project team will also be exploring collaborative relationships with colleagues at the Smithsonian Institution and the Library of Congress.

Format

The initial presentation of the project will primarily use HTML, to build the foundation of the site. As soon as possible, we will begin SGML tagging of the documents. We intend to provide HTML conversions "on the fly" using appropriate filters when available.

Although the project's focus will be on electronic information access, we will also perform preservation standard, archival scans of all images and documents used in the project. These electronic documents will benefit the library community as a whole.

Project Outline

I. Comprehensive summary of Darrow's work

- a. Strawberry Breeding in North America Before Darrow
 - 1. Darrow book chapters, full-text
 - 2. Pre-Darrow USDA circulars. Depending on project resources, these materials can either be digitized as full-text or we can simply provide bibliographic citations for them.
- b. Darrow's Career
 - 1. Darrow book -- Introduction, Foreword, Breeding at USDA and Experiment Stations, Hotlinked Index
 - 2. Bibliography of Darrow's published work
 - 3. Digitize relevant articles from 1937 USDA Yearbook of Agriculture; and USDA Technical Bulletin 453, "Response of Strawberry Varieties and Species to Duration of the Daily Light Period"
 - 4. Darrow's work as a germplasm collector
 - 5. Darrow's career outside USDA
 - a. Darrow pioneered the first "pick your own" strawberry farm in Maryland.
 - b. Interviews, oral histories with family members.
 - c. Professional associations and honors (See Appendix II)
 - 6. Pending funds for processing, we would like to produce an SGML finding aid for the Darrow manuscript collection, using the Enhanced Archival Description (EAD) format
- c. (Named) Strawberry Varieties Developed at USDA -- Provide list, as well as images from NAL Special Collections.
- d. Current Research at USDA/ARS on Strawberries
 - 1. Plant Genome Research Program
 - 2. CRIS
 - 3. USDA - ARS Small Fruit Lab; Northwest Center for Small Fruits Research.

II. History of the Strawberry Plant

- a. Bibliography of AGRICOLA records.
- b. Darrow book chapters, full-text
- c. Duchesne, Sir Walter Raleigh as pioneers: Online guide to related manuscript materials in NAL Special Collections and around the world
- d. Historical Maps showing cultivation by region over time in the US. (Data from Darrow Manuscript Collection; Agricultural Census Data)
- e. Photo exhibit of historic strawberries, GRIN/Corvallis

III. Strawberry Genome

- a. Bibliography of AGRICOLA records.
- b. Entrez nucleic acid search results, NCBI
- c. Darrow book chapters, full-text

IV. Physiology and Morphology of the Strawberry

- a. Bibliography of AGRICOLA records.
- b. Darrow book chapters, full-text

V. Disease and Pest Resistance

- a. Bibliography of AGRICOLA records.
- b. Darrow book chapters, full-text
- c. Research at Small Fruit Laboratory, USDA-ARS, BARC.

VI. Climate and the Strawberry

- a. Bibliography of AGRICOLA records.
- b. Darrow book chapters, full-text

VII. Production and Gardening

- a. Bibliography of AGRICOLA records.
- b. Darrow book chapters, full-text
- c. Links
 - 1. Cornell Cooperative Extension
 - 2. Ohio State University, Cooperative Extension Factsheets
 - 3. The U.S. Strawberry Industry: ERS publication, 1995. Digitize entire publication on state of the industry, update with current statistics from ERS WWW site and link to ERS.

VIII. Current Research

- a. CRIS
- b. GRIN/Corvallis
- c. Education¹
- d. Advances in Strawberry Production
- e. Patent Search for strawberry cultivars
- f. Plant Variety Protection Certificates
- g. USDA, ERS Agricultural Statistics

¹See Links: Education

IX. LINKS

a. Education (Sites which contain valuable information on strawberries)

1. WebGarden Ohio State Extension Service Database
2. Northwest Berry and Grape InfoNet - Oregon State University Extension Service
3. The Ohio State University Extension - Extension Factsheet
4. UC Fruit and Nut Research and Information Center
5. University of Delaware Cooperative Extension
6. University of Florida (Strawberry IPM and Pesticide Use Survey 1995)
7. North Carolina State University, Department of Horticulture
8. American Society for Horticultural Science

b. Regional

1. Strawberry Guide, Nebraska
2. Ohio State Factsheet

c. International

1. Darrow book chapters on Europe and other countries
 - a. Correspondence with International Colleagues in Darrow manuscript collection
2. Strawberry Breeding Lab, Japan
3. Nova Scotia Strawberry Newsletters, Department of Agriculture and Marketing
4. Peter Engstrom, Dept. of Physiological Botany, Uppsala University, Sweden
5. CPRO-DLO, the Netherlands organization for Agricultural Research
6. Deborah Buszard, McGill University
7. British Columbia Strawberry Industry

d. Industry

1. Strawberry Fieldworks (California Strawberry Commission)
2. Florida Strawberry Growers Association
3. North American Strawberry Growers Association
4. Strawberry Nurserymen's Association
5. Washington Strawberry Commission
6. Oregon Berry Commission
7. The U.S. Strawberry Industry: ERS publication, 1995. Digitize entire publication on state of the industry, update with current statistics from ERS WWW site and link to ERS.



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USDA



History of the Strawberry



Strawberry Genome



Physiology and
Morphology



Disease and
Pest Resistance



Climate



Production and
Gardening



Current Research



External Links



Strawberry Improvement: Past and Future



Introduction to the Project

Strawberry Breeding at USDA

1. Strawberry Breeding in North American Pre-Darrow
2. George Darrow's Career
 - a. Book introduction
 - b. Bibliography of Darrow's published work
 - c. Darrow full-text publications
 - d. Darrow as germplasm collector
 - e. Darrow's career outside USDA
 - f. SGML finding aid to Darrow manuscript collection
3. Strawberry Varieties Developed at USDA
4. Current Research at USDA-ARS

External Links

Education

International

Industry

Judy Ruttenberg

5033 Kansas Avenue, N.W.
Washington, D.C. 20011
202-829-2106
jfr@wam.umd.edu

References available upon request

EDUCATION

M.L.S. December 1996: Archives
University of Maryland, College Park

M.A. 1994: American History (Cultural and Political)
University of Massachusetts, Amherst — *Distinction*

B.A. 1992: History
University of Michigan — *Distinction*

WORK EXPERIENCE

NATIONAL AGRICULTURAL LIBRARY: October 1995 – Present

Assistant Librarian, Plant Genome Data & Information Center (PGDIC) – Responsible for coordinating an online digital preservation project, HTML conversion for PGDIC Homepage, answering reference queries, creating bibliographies, maintaining reference statistics, and managing the inventory and distribution of PGDIC publications.

MOORLAND-SPINGARN RESEARCH CENTER
HOWARD UNIVERSITY: Summer 1996

Manuscript Intern – Processed the manuscript papers of Rayford W. Logan, including arrangement, description, basic preservation, and the creation of a finding aid.

NATIONAL MUSEUM OF AMERICAN HISTORY
ARCHIVES CENTER: March – September 1995

Contracted Researcher, Ethnic Imagery Project – Surveyed and photo-documented archival collections in preparation for integration into an image database.

UNIVERSITY OF MASSACHUSETTS, AMHERST
DEPARTMENT OF HISTORY: January 1993 – May 1994

Writing Instructor, Undergraduate History Program – Instructed upper-class undergraduate history majors in the mechanics of writing research papers.

Teaching Assistant, Introduction to American History – Taught weekly discussion and review sessions, graded papers and exams.

ADDITIONAL SKILLS

Computer skills: Basic UNIX; Advanced Macintosh and Windows skills: Adobe Photoshop, FileMaker Pro, Lotus 1-2-3. Internet and HTML proficient.

Online search skills: Dialog.

Language skills: Reading knowledge of Spanish.

Appendix II

Memberships and Honors of George Darrow

Memberships:

The American Society of Horticultural Science
The Botanical Society of Washington
American Genetic Association
American Association for the Advancement of Science
American Horticultural Society
American Pomological Society
North American Strawberry Growers Association
American Hemerocallis Society

Honors and Awards:

Recipient, Wilder Medal, 1948 and 1952, American Pomological Society
Recipient, USDA Distinguished Service Award, 1954
Recipient, Liberty Hyde Bailey Award, 1960, American Horticultural Society
Recipient, honorary degree of Doctor of Science, University of North Carolina, 1963
Prince George's County Hall of Fame, 1996

George McMillan Darrow (1889–1983)

Gene J. Galletta

Fruit Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, MD 20705

George McMillan Darrow, America's foremost authority on small fruits, was born in Springfield, Vt., on 2 Feb. 1889. He received his undergraduate degree at Middlebury College in 1910 and continued his education at Cornell Univ., graduating in 1911 with an AM in horticulture. His entire professional career, spanning 46 years from 1911 to 1957, was spent with the U.S. Dept. of Agriculture (USDA). Darrow did find time to pursue graduate studies at Johns Hopkins Univ., where he received his PhD in plant physiology and genetics in 1927. By the time he returned from a short tour of duty with the army during World War I, Darrow already was acknowledged as the USDA's small-fruit expert. Beginning in 1928, he was the leader of small-fruit investigations for the USDA and in 1945 was appointed the administrative head of the Small Fruits Research Section, Plant Industry Station, Beltsville, Md.

George Darrow is most celebrated as the originator of superior small-fruit cultivars. Many of these introductions, e.g., 'Blakemore', 'Fairfax', 'Albritton', and 'Temple' strawberries; 'Van Fleet' raspberry; 'Brainard' blackberry; and 'Bluecrop', 'Berkeley', 'Coville', 'Wolcott', and 'Tifblue' blueberries, set new standards of varietal excellence for their respective species and were used widely as parents by other breeders. Strawberry and blueberry breeding work was enhanced greatly by the cooperative state-federal relationships established by Darrow. Frequently unappreciated, however, is Darrow's compelling interest in the range of variation in native American fruit species, and their domestication potential. Darrow's breeding success was undergirded by his broad understanding of natural species variation, his collection of diverse germplasm bases, and his extensive use of species hybridization and exploitation of polyploid forms. He also had a keen sense of which characteristics were vital to the commercial success of a clone or to its possibilities as breeding stock. His research on photoperiodism in strawberry led to a better understanding of the factors involved in the climatic adaptation of varieties. It showed that flower initiation occurs in most varieties only under medium or shorter daylengths. He presented his findings in the classical treatise *Response of Strawberry Varieties and Species to Duration of the Daily Light Period*, published in 1931. As testament to his outstanding leadership capabilities, Darrow organized teams to study red stele root-rot resistance, virus indexing, and certified plant production of strawberry. He also led blueberry species exploration and study teams.



Darrow's early studies of fruit handling, transportation, and cultural practices, and of climatic influences on fruit growth led him to write a definitive series of authoritative and concise farmers' bulletins on small-fruit domestication and production. A prolific writer, he eventually wrote more than 200 research or review articles, bulletins, and book chapters. Darrow's outstanding descriptions of fruit genus variation, elite cultivars, potential parents, and comprehensive breeding aims and breeding program synopses appear in the classic 1937 *USDA Yearbook of Agriculture*. Henry A. Wallace, former secretary of agriculture and former vice president of the United States, encouraged Darrow to write *The Strawberry: History, Breeding, and Physiology*, published in 1966. This monumental monograph soon became a classic.

Darrow continued to write, mostly about small-fruit breeding opportunities, summaries, and varieties, and plant exploration, for many years after his retirement in 1957. During that time, Darrow began breeding daylilies. He introduced 59 varieties, which are registered with the American Hemerocallis Society. His introductions begin with the name Olallie, which was the name of his farm in Maryland. After his eyesight began to fail in 1979, Darrow's son Dan, and Dan's wife Ellen, began transporting the daylily collection to their farm in Vermont. Darrow's grandson Christopher continues to breed and market the Olallie daylilies. Darrow also established the first family pick-your-own strawberry planting in Maryland, propagated bamboo, and was an official USDA unpaid collaborator until 1973, helping with blueberry breeding and selection and seedling evaluations. He was a welcome, stimulating, and interested visitor to

his old workplace at Beltsville on a regular basis, even when he was unable to drive and had to be partially supported by others on his visits to the field. He took copious notes on selections and on discussions with the staff until he was too frail to leave his home. Even then, his successors visited him regularly and sent him reports because they valued his input. This is indicative of Darrow's influence and the value of his legacy. He set the tone of small-fruit investigations in the United States and, through his extensive correspondence and writings, was influential abroad even though his foreign travel was limited.

Darrow served horticulture in many ways, including as a member and officer in numerous professional societies. He joined ASHS in 1928 and was elected president of the Society in 1949. In 1965 he was in the first group to be named fellows of ASHS. He also was active in the Botanical Society of Washington, American Genetic Association, American Association for the Advancement of Science, American Horticultural Society, American Pomological Society, North American Strawberry Growers Association, and the American Hemerocallis Society. He received the highly coveted Wilder Medal from the American Pomological Society in 1948 for leadership in small-fruit development, and in 1952, he shared in a second Wilder Medal awarded to the USDA Small Fruit Unit for production of virus-free strawberries. The USDA presented him its Distinguished Service Award in 1954. He was the 1960 recipient of the Liberty Hyde Bailey Award of the American Horticultural Society. In 1962 he received an honorary PhD from North Carolina State Univ. for his work to improve the strawberry and blueberry varieties grown in that state.

George Darrow was one of those rare individuals whose keen intellect, considerable energy, and broad professional interests enabled him to master and help define a field as diverse as early twentieth century American pomology. Moreover, his personal charisma, utter trustworthiness, boundless enthusiasm, love for young people, and excellent communication skills enabled him to talk to farmers, write, and plan and execute research programs. His legacy to modern horticulturists includes 1) superior small-fruit germplasm—both cultivars and elite parents; 2) comprehensive and insightful writings about the botany, genetics, ontogeny, anatomy, pathology, and physiology of fruit and ornamental plants; and 3) research, teaching, and extension ideas. For those of us whom he influenced when we were young, it is our continuing privilege to have worked with and enjoyed the inspiration of one of the "horticultural giants" of the twentieth century.

Received for publication 14 Oct. 1992.



Figure 1. George M. Darrow, circa 1940.

245 Dr. George Darrow: Legacy and Foundation for Tomorrow's Strawberries¹

Alan E. Fusonie²

National Agricultural Library

United States Department of Agriculture
Beltsville, Maryland 20705

Today successful "you pick" strawberry farms proliferate in the countryside and a viable strawberry industry provides strong economic inputs into America's food chain. Consumers are looking for greater health values and better taste in the fruit that they buy. The recent discovery that the ellagic acid, found in strawberries and other fruits and nuts, acts as a potent anticancer compound may have important implications for the strawberry industry and for the role of strawberries in our diet. At the USDA-ARS Fruit Laboratory in Beltsville, Maryland, Drs. John Maas, plant pathologist, and Gene Galletta, plant geneticist, with their research team, are carrying on the USDA tradition of strawberry research. Their work continues a 71-year-old strawberry improvement program pioneered by Dr. George M. Darrow at Glenn Dale, Maryland, in 1919, and since carried on by ARS scientists, Drs. Don Scott, Arlen Draper, John McGrew, Dick Converse, John Maas, and Gene Galletta.

Who was this scientific promoter of a better strawberry and how should we remember him? Dr. George McMillan Darrow (Figs. 1, 2, 3), Wilder Medal recipient and internationally famous pomologist and small fruits breeder, was born in Springfield, Vermont, on February 2, 1889. Raised on a dairy farm, he graduated from Middleburg College in 1910, specializing in Botany, and received his Master of Science degree from Cornell University in 1911 and immediately began his career with the USDA where he continued until his retirement in 1957. He married Grace Chapman in 1919 and raised six children.

Dr. Darrow began strawberry breeding and cultivar work in 1919 at Glenn Dale, Maryland, and began cooperative work in 1928 in Willard, North Carolina, at the Coastal Plain Experiment Station. The strawberry breeding program at Glenn Dale was transferred in 1932 to the USDA station at Beltsville, Maryland, where the program continues today. At Willard, Darrow either developed or tested extensively the 'Albritton', 'Blakemore', 'Massey', 'Southland', 'Eleanor Roosevelt', 'Daybreak', and 'Fairmore' strawberry cultivars. Darrow's work on the physiology of the strawberry earned him a doctorate at Johns Hopkins University in Baltimore in 1927. The cultivar 'Blakemore', his first strawberry introduction (1929), set a new standard of fruit firmness and

production. It was the most important cultivar of the United States for 20 years. Through cooperation with experiment stations in Maryland, North Carolina, and Oregon, the USDA strawberry breeding began to expand.

As an authority on strawberries, Dr. Darrow became one of the leading contributors to strawberry literature in the world. As early as 1934, he published an important work entitled *Response of Strawberry Varieties and Species to Duration of the Daily Light Period* (USDA Tech. Bull. 453) showing that strawberry development is controlled by photoperiod. In the early 1940's, when it became evident that damaging viruses were already affecting strawberry production, Darrow encouraged plant pathologists, horticulturalists, and nurserymen to develop and propagate virus-free plants.

In 1962, George Darrow's nearly half-century of involvement in fruit research had earned him the title of "Dean of American Small Fruit Breeders" in this country. By this time Darrow was responsible for the development of 28 cultivars of strawberries, 12 of which are of major importance today, and for establishing a foundation of genetic material that would figure prominently in breeding new varieties for many years to come. No one had a wider outreach among the American strawberry breeders than George Darrow. To Professor Howard Barss of Oregon State, Dr. Darrow was, "a man of industry and vision . . . a good fellow and fine friend." Don Scott, Leader of Small Fruit and Grape Investigations-USDA, noted in a November 9, 1962 letter that Darrow had become a truly respected leader in that: ". . . workers, teachers, extension specialists and others throughout this country, Europe, and Latin America seek his advice and assistance. . ."

After his retirement in 1957, Dr. Darrow and his sons successfully pioneered a consumer-oriented "pick-your-own" concept for marketing their family strawberry production. At the urging of his good friend, Henry A. Wallace, former Vice President of the United States, Darrow also began researching and writing the book, *The Strawberry: History, Breeding and Physiology*, which was published in 1966 (Fig. 4). A talented author and a successful researcher, George Darrow was also a modest and unassuming man. In commenting on Darrow's landmark work, Secretary Wallace noted that "Dr. Darrow writes about many strawberry breeders in this book but not about himself."

¹Accepted for publication 1 June 1990.

²Historian, and Head, Special Collections, National Agricultural Library.

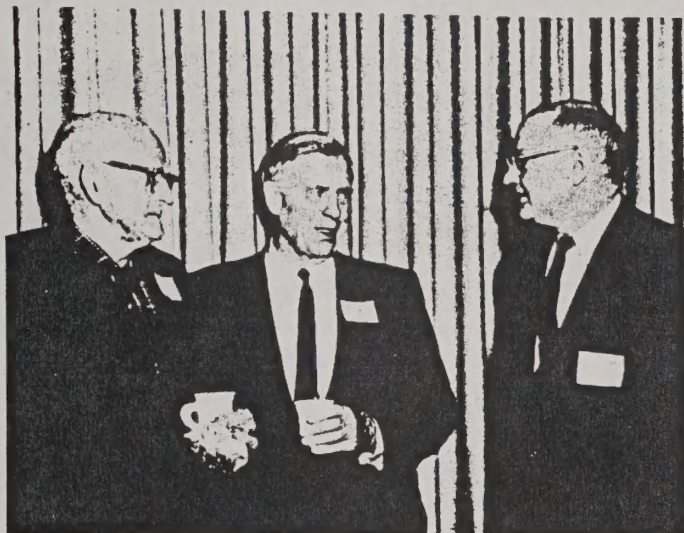


Figure 2. In attendance at the First North American Strawberry Conference held at Rutgers University in 1963 were George M. Darrow (left), Collaborator and former Leader of the Small Fruits and Grapes Investigations, USDA; Mr. Henry Wallace (center), geneticist and farmer, former Vice President of the United States, and served in the Cabinet as Secretary of Agriculture; and Dr. Donald H. Scott (right), Leader, Small Fruits and Grapes Investigations, USDA.



Figure 3. Dr. John R. Magness (left), former Chief, Fruit and Nut Crops Research Branch, USDA, Beltsville, Maryland, and George M. Darrow sample the new strawberry cultivar 'Scott', named in honor of Dr. Donald H. Scott. Dr. Darrow, here at age 85, always displayed an active interest in strawberry improvement.

THE STRAWBERRY

History, Breeding and Physiology

BY GEORGE M. DARROW



HOLT, RINEHART AND WINSTON
NEW YORK CHICAGO
SAN FRANCISCO

Figure 4. Title page to George M. Darrow's treatise, *The Strawberry: History, Breeding and Physiology*, published by Holt, Rinehart and Winston in 1966 soon sold out and has become a greatly coveted book.



Figure 5. The legacy of George M. Darrow is passed on to future generations. Drs. John L. Maas and Gene J. Galletta of the USDA-ARS Fruit Laboratory, Beltsville, Maryland, are honored by the North American Strawberry Growers Association in recognition for exceptional leadership, service and contributions to strawberry growers and the industry through breeding and development of new strawberry cultivars with outstanding fruit quality and disease resistance (Beltsville, Maryland, September 19, 1989).



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As early as November 12, 1962, Walter E. Ballinger, then Associate Professor of Horticultural Science at North Carolina State College, may have succinctly captured Dr. Darrow's place in history when he wrote, "What this world of agriculture would be, if there were countless other men like him!" Certainly, his legacy includes a wealth of information, cultivars, and a network of indebted cooperators within the strawberry industry and scientific research community.

In 1975, Jules Janick and James N. Moore dedicated their new book, *Advances in Fruit Breeding*, to Dr. Darrow and presented him with a special copy at a national meeting of fruit breeders at Beltsville. The dedication of this book, written by John R. Magness, stated in part:

"This book is dedicated to Dr. George M. Darrow, premier breeder of strawberries and blueberries, whose research accomplishments, spanning a career of 46 years with the United States Department of Agriculture, are unparalleled in the history of fruit cultivar improvement. . . . Why has Dr. Darrow's work been so successful? With a firm foundation in genetics, he is an all-around plantsman, a keen observer interested in every facet of the plant and its environment. Added to this has been the magnitude of the work which involved hundreds of thousands of progeny plants, both of strawberry and

blueberry. Further, he has been a prolific author, authoring many research papers and popular articles, climaxed by his excellent and authoritative book, *The Strawberry: History, Breeding and Physiology*."

On September 19, 1989, the North American Strawberry Growers Association (NASGA) recognized two scientists, Dr. John L. Maas and Dr. Gene J. Galletta, for their outstanding work with strawberries (Fig. 5). The award ceremony was held at the National Agricultural Library in conjunction with an exhibit of books, photos, and original art honoring the late Dr. George Darrow and commemorating the 100th year of his birth. Throughout this special program, there was a real sense of continuity reflected in the collegiality of the attendees from the public and private sectors, in the thoughtful recognition of past achievements and in the optimism about the future. In his closing remarks, Dr. Essex Finney, Acting Director of the Agricultural Research Service's Beltsville Area noted that, "There has never been a [national] crisis in strawberry production." This continuity of strawberry production, in which the United States is the world leader, through improved and disease-resistant germplasm, is the best tribute to George Darrow's leadership and wisdom which his successors can provide.